−SE6%. These results suggest that replacement of rabbit ATG with Alemtuzumab may improve engraftment and decrease GVHD rates without resulting in delays in immune reconstitution.

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CYSTATIN C IS A MORE SENSITIVE ESTIMATE OF KIDNEY FUNCTION THAN CREATININE IN PEDIATRIC AUTOLOGOUS BONE MARROW TRANSPLANTATION

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Overview: Accurate assessment of kidney function is essential in the care of bone marrow transplant (BMT) patients. Both cystatin C, a protease inhibitor produced by all nucleated cells and measured in a single blood sample, and creatinine are used to estimate kidney function (glomerular filtration rate, GFR). While creatinine is influenced by muscle mass, cystatin C is potentially modified by corticosteroids, thyroid function, and the white blood cell count (WBC). The literature is conflicting on the validity of cystatin C measurements in BMT and oncology patients, and the effect of leukopenia is understudied. We hypothesize that cystatin C is a more sensitive estimate of kidney function in BMT patients, while controlling for the WBC.

Methods: We retrospectively compared cystatin C to creatinine for predicting nuclear GFR (technetium-99m-DTPA; nucGFR) in pediatric recipients of autologous BMTs. General linear mixed models were used to calculate regression and intra-class correlation coefficients (ICC, ranging from 0-1 with higher values indicating less variation/greater reliability between the estimates). Prediction models used cystatin C GFR = [77.24*cys$^{-1.2623}$] (cysGFR), with and without WBC, and Schwartz GFR = [0.413*height (cm)/creatinine] (schGFR).

Results: 12 patients (median age 3.5 yrs, range 2-10 yrs) underwent 29 tandem BMTs (median 2 BMTs/patient, range 1-4) for medulloblastoma (n = 7), neuroblastoma (n = 4), and atypical teratoid rhabdoid tumor (n = 1). All patients except 1 had normal thyroid function. 3 patients received steroids (2 stress dosing and 1 high-dose for veno-occlusive disease of the liver). GFRs (mean±std error) in ml/min/1.73m^2 (normal > 90) were 142.0±9.0 (nuc), 136.5±6.2 (cys), and 132.1±5.1 (sch). ICCs were 0.54 for nucGFR versus cysGFR and 0.26 for nucGFR versus schGFR. Furthermore, the Pearson correlation coefficient was much higher for cysGFR (0.80, $p < 0.001$) than for schGFR (0.22, $p = 0.36$) compared to nucGFR. Regression coefficients and the 95% confidence intervals (CI) for the prediction models are shown in the table.

Conclusions: Cystatin C was a statistically significant predictor of nucGFR while creatinine was not. WBC was of borderline significance in prediction of nucGFR using cysGFR. To maximize clinical utility, future research will confirm these findings by accounting for additional confounders in a larger group of patients and a wider range of GFR.

Independent predictors in model for nucGFR	β regression coefficients [95% CI]
cysGFR*	0.96 [0.77, 1.14]
cysGFR* & WBC	1.08 [0.94, 1.23] & 0.67 [-1.02, 2.36]
schGFR	0.17 [-0.072, 0.41]

*statistically significant ($p<0.05$)

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A MULTIDISCIPLINARY APPROACH TO ADHERENCE IMPROVEMENT USING EDUCATION AND MEDICATION BOXES FOR ADOLESCENTS AND YOUNG ADULTS WHO HAVE UNDERGONE ALLOGENEIC HEMATOPOEITIC STEM CELL TRANSPLANTATION

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Achieving adherence to immunosuppressive medications in the adolescent population of post allogeneic stem cell transplant can be challenging. Literature has documented consistently a link between regimen complexity and adherence rates. Non-adherence can put patients at increase risk of uncontrolled graft versus host disease. While there is literature describing adolescent barriers to adherence and their attitudes regarding medications, no studies have evaluated the use of medication boxes in combination with a multidisciplinary patient education on adherence. A pilot study was undertaken to see if use of a medication box combined with a 15 minute discussion with a pharmacist and social worker about barriers to adherence, the importance of medication adherence, and how to use the box will improve adherence in adolescent post allogeneic stem cell transplant patients. Medication boxes were initially filled by a health care professional on the patients' clinic day. Pill counts were used to assess adherence rates. Patients completed surveys about their perception on their medications prior to, during, and after the intervention. 11 patients consented to study to date (ages 13-25); 1 patient withdrew, 1 patient died prior to start of the study, and 1 patient has yet to start. During the active medication box phase of the study, patient's adherence rates ranged from 57-100% with all but one patient having an adherence rate > 80%. When study participants where asked if they do a good job caring for themselves 7 out of 9 responded positively (somewhat to strong agreement); although, 5 out of 8 reported missed doses at least once during the study duration. Of note, 6 out of 9 participants at some point during the study duration reported agreement or neutrality to the statement 'I don't think I need my medication' and 8 out of 9 patients reported agreement or neutrality to the statement 'My doctors want me to take too many medications'. These findings are of interest because they may reflect unique characteristics of adolescent development, how their views on their health and medications may change throughout a treatment course, which may have direct effect on medication adherence. This pilot study supports the use of medication boxes for adolescents post allogeneic stem cell transplantation. Further studies need to be done to assess what patients would most benefit by having their medication box filled for them.

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ENGRAFTMENT KINETICS IN CHILDREN AFTER REDUCED INTENSITY CONDITIONING HEMATOPOIETIC STEM CELL TRANSPLANTATION (RIC-HSCT)

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The kinetics of stem cell engraftment following RIC-HSCT are different from that of myeloablative transplant; previous analyses are limited to adults. Between 2003 and 2010, we performed RIC-HSCT in 88 children with malignant (n = 40) or non-malignant (48) diseases; none had prior HSCT. Patient characteristics are shown in Table 1. Post-HSCT, total white cells donor chimerism was monitored serially by variable number tandem repeat analysis once the peripheral white blood cell count exceeded 1,000 cells/ml. The cumulative incidence of patients reaching 50% and 90% donor chimerism by +20/40/60 days post-HSCT was 67/85/86% and 41/68/72%, respectively. Eight patients (8/88 = 9%) had primary graft failure, with chimerism never reaching 20%. Sixty-six patients (75%) have peak chimerism over 90%, whereas 14 patients (16%) have peak chimerism between 20-90%. Among those engrafted (n = 82), chimerism in 57 patients (70%) was durable and did not decline with time, but in 25 patients (30%), there was a drop in chimerism of > 10% between two consecutive measurements. Median time of chimerism drop was +60 days post-HSCT (range 17-193 days). Seven patients (7/82 = 8%) experienced relapse of leukemia soon after the drop was detected, 12 patients (15%) had stabilization or improvement of chimerism after withdrawal of immunosuppression and/or donor lymphocyte infusion (DLI), and 6 patients (7%) had no recovery despite immune manipulation, resulting in secondary graft failure. There is no correlation between the magnitude of chimerism drop and the response to immune manipulation. There were differences in engraftment kinetics among patients with malignant or non-malignant diseases. In the malignant group, the cumulative incidence of 90% donor chimerism at +100 days was 87.5%, and at one year, the percentage of patients with full or mixed chimerism was 90% and 10%, respectively. By contrast, in the non-